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Noah D Finkelstein* (noah.finkelstein@colorado.edu), Department of Physics, UCB-390, University of Colorado, Boulder, CO 80309. *Physics Education Research: tools for educational transformation at a critical time.*

Currently, unprecedented national attention is now being paid to the outcomes of and needs for educational research within disciplinary fields. After framing the national scale scene of physics education, and how physics education research (PER) is positioned to contribute to the national dialog, I will review the growth of some key tools that have helped transform physics courses. This work develops a new theoretical line of inquiry in PER through experimental work on student learning in physics at the individual, the course, and the departmental scales. I will present samples of these scales reviewing: course transformation at the introductory to advanced level in physics, research on how subtle faculty choices that influence the impacts of these course transformations, and the development of a framework for understanding (and effecting?) sustained change in undergraduate science math and engineering education. (Received September 24, 2012)